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EXAMINER	
SELBY, GEVELL V	

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/667,424	SOGAWA, YOSHIYUKI	
	Examiner	Art Unit	
	Gevell Selby	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 September 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/7/04 has been entered.

Response to Arguments

2. Applicant's arguments, see the motion, filed 10/4/04, with respect to claim 5 have been fully considered and are persuasive. The provisional nonstatutory double patenting rejection of claim 5 has been withdrawn.

3. Applicant's arguments filed in the amendment on 9/7/04 have been fully considered but they are not persuasive.

The applicant submits the prior art does not disclose the following features of the invention:

Claims 1 and 15) wherein optical axes of said main camera and said sub camera are inclined toward the main camera side with a predetermined angle defined by each of the optical axes ad the shooting direction;

Claims 3 and 17) the optical axis of the sub camera is inclined toward the sub-camera side with respect to the optical axis of the main camera;

Claim 16) Miura performs the detection in an area based upon someone's judgment using spectacles; whereas, the present invention has a device that detects the corresponding are i.e. an image processing device;

Claim 2) Miura has a structure have an optical axis of the sub camera the is inclined towards the main camera side with respect to the optical axis of the main camera, and that the infinite distance corresponding point which corresponds to the small area at edge of the reference image does not exist within the comparison image;

In the Tanigawa reference, the infinite distance corresponding point can not be calculated for the small area at the edge of the reference image.

Claims 10,12,13, and 14) the optical is inclined toward the sub-camera side with respect to the optical axis of the main camera. The Examiner respectfully disagrees.

Examiner's Answer:

Re claims 1, 3, 15 and 17) The Miura reference discloses that both camera are adjusted rotatably about their optical axis either to the left or right (column 3, lines 62-65, and column 4, lines 7-9), and when one camera captures the target object the second camera is rotated so that the cameras have the correct convergence angle (see column 5, lines 12-44). Therefore, when the first camera is inclined toward its side to pick up a target object, the second camera is also adjusted to be inclined towards the first cameras side so that the cameras are aligned correctly. The angles of inclination of the cameras are predefined in that they are set in the adjustment operation before normal image capture. Therefore, the Miura reference discloses the claimed limitations of claims 1 and 15 and any incorporation of these claims into dependent claims.

Re claim 16) In the Miura reference the area of three-dimensional distance distribution is obtained by in the image processing unit (18) in the form of a stereographic image displayed on a monitor (see column 4, lines 23-32). It is inherent that if the axis z of the camera was aligned with the central axis of a vehicle, the area the two camera capture would be left-right symmetric because the cameras are aligned to capture a stereographic image. Therefore, the Miura reference discloses the claimed limitations of claim 16.

Re claim 2)In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The Miura reference discloses that the two cameras can both be adjusted both horizontally (see column 3, lines 62-65, and column 4, lines 7-9) and vertically (see (column 3, lines 32-35, and column 3, lines 45-47). Thus, the stereo cameras of the Miura reference are adjusted to incline to the first camera side or the second camera side depending the target object. The Miura reference can then use the method of Tanigawa to calculate the infinite distance corresponding point in any region of the infinite distance corresponding point. Therefore, the Miura reference discloses the claimed limitations of claim 2 and any incorporation of these claims into dependent claims.

Re Claims 10,12,13, and 14) The Miura reference discloses that both camera are adjusted rotatably about their optical axis either to the left or right (column 3, lines 62-65, and column 4, lines 7-9), and when one camera captures the target object the second camera is rotated so that the cameras have the correct convergence angle (see column 5, lines 12-44). Therefore, when

the first camera is inclined toward its side to pick up a target object, the second camera is also adjusted to be inclined towards the first cameras side so that the cameras are aligned correctly.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 3, 5, 9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al., US 4879,596.

In regard to claim 1, Miura et al., US 4,879,596, discloses a stereo camera apparatus (see figure 5) comprising:

a main camera taking photograph of an object (see figure 4, element 20a and column 3, lines 8-9); and

a sub-camera taking photograph of said object from a point of view different from a point of view of said main camera (see figure 4, element 20b and column 3 lines 8-9),

said main camera and sub-camera being disposed with a predetermined spacing, a shooting direction of said stereo camera is substantially perpendicular to said predetermined spacing in a baseline between the main camera and the sub camera (see figure 2, elements 20a and 20b and column 1, line 63- column 2, line 5),

wherein optical axes of said main camera and said sub-camera are adjustable (see figure 4B, directions E or F, column 3, lines 62-65, and column 4, lines 7-9).

Miura et al., does not state that the two cameras are inclined toward the main camera side with a predetermined angle defined by each of the optical axes and the shooting direction. The Miura reference discloses that the two cameras can both be adjusted both horizontally (see column 3, lines 62-65, and column 4, lines 7-9) and vertically (see (column 3, lines 32-35, and column 3, lines 45-47). Thus, the stereo cameras of the Miura reference are adjusted to incline to the first camera side or the second camera side depending the target object. The reference does teach that when one camera captures the target object the second camera is rotated so that the cameras have the correct convergence angle (see column 5, lines 12-44).

Therefore, it would have been obvious to one skilled in the art to adjust both cameras of the Miura reference to have an incline towards the main camera side with a predetermined angle defined by each of the optical axes and the shooting direction when capturing an object outside of the sub-camera's viewing area on the main camera side in order to achieve the correct convergence angle.

In regard to claim 3, Miura et al., US 4,879,596, discloses the stereo camera apparatus as recited in claim 1, wherein the optical axis of said sub-camera is adjustable (see figure 4B, directions E or F and column 5, lines 38-44).

Miura et al., does not state that the two cameras are inclined toward the main camera side with respect to the shooting direction between said main camera and said sub-camera but the reference does teach that when one camera captures the target object the second camera is rotated so that its optical axis coincides with first camera (see column 5, lines 12-44). Therefore, it would have been obvious to one skilled in the art to adjust both cameras to have an incline towards the main camera side when capturing an object outside of the sub camera's viewing area on the main camera side in order to achieve the correct convergence angle.

In regard to claim 5, Miura et al., US 4,879,596, discloses the stereo camera apparatus as recited in claim 1, further comprising:

a camera stay (see figure 2, element 24) for mounting said cameras thereon, wherein a longitudinal direction of said camera stay is substantially perpendicular to the shooting direction (see column 3, lines 9-12).

In regard to claim 9, Miura et al., US 4,879,596, discloses the stereo camera apparatus as recited in claim 1, but does not disclose that a first acute angle defined between said optical axis of said main camera and the baseline is smaller than a second acute angle defined between said optical axis of said sub-camera and the baseline.

It would have been obvious to one skilled in the art that since both cameras can be adjusted freely in the horizontal direction, the sub-camera would be pivoted less than the main camera in order for the camera, to have the same field of view.

In regard to claim16, Miura et al., US 4,879,596, discloses the stereo camera apparatus as recited in claim 1,

> wherein angles of inclination of said main camera and said sub-camera are set to be such angles that an area being substantially left-right symmetric with respect to a central axis of a vehicle parallel to the shooting direction [see figure 6, elements 20a and 20b: It is inherent that if the axis z of the camera was aligned with the central axis of a vehicle, the area the two camera capture would be left-right symmetric because the cameras are aligned to capture a stereographic image.], the area being obtained by an image processing unit on the basis of images photographed by said cameras (column 2, line 23-32).

7. Claims 2, 4, 10 - 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al, US 4,879,596, in view if Tanigawa et al., US 5,915,033.

In regard to claim 2, Miura et al., US 4,879,596, discloses the stereo camera apparatus as recited in claim 1,

> wherein angles of inclination of said main camera and said sub-camera are set to be such angles that an area being substantially left-right symmetric with respect to a central axis of a vehicle parallel to the shooting direction (see figure 6, elements 20a and 20b).

It is inherent that if an axis z was aligned with the central axis of a vehicle, the two cameras would be left-right symmetric.

The Miura reference does not disclose:

image processing means of calculating a three dimensional distance distribution of said object based on a positional difference between a region in a reference image photographed by said main camera and a corresponding area in a comparative image photographed by said sub-camera to an image signal of said region,

wherein said corresponding area is searched in a search are having predetermined length which extends from a position substantially corresponding to said region, said positional difference is obtained from an area which capable of setting said search area inside of said comparative image.

Tanigawa et al, US 5,915,033, discloses a stereo camera system comprising:

image processing means (see figure 1(b), element 50) of calculating a three dimensional distance distribution of said object based on a positional difference between a region in a reference image (see figure 1b, element WD1) photographed by said main camera and a corresponding area in a comparative image photographed by said sub-camera (see figure 1b, element WD2) to an image signal of said region (see column 2, line 38 to column 3, line 8),

wherein said corresponding area is searched in a search area having predetermined length which extends from a position substantially corresponding to said region (see column 3, lines 66 to column 4, line 9: It is inherent search

areas WD1 and WD2 have a predetermined length in order for divide the image data into a plurality of windows) , said positional difference is obtained from an area which capable of setting said search area inside of said comparative image (see column 4, lines 10-21).

It would have been obvious to a person skilled in the art at the time of invention to modify Miura et al, US 4,879,596, in view if Tanigawa et al., US 5,915,033, to have an image processing means to use method of triangulation to calculate the distance from a searching a plurality of predetermined regions and correct the distance values as taught by Tanigawa.

In regard to claim 4, Miura et al, US 4,879,596, in view if Tanigawa et al., US 5,915,033, discloses the stereo camera apparatus as recited in claim 2. Miura et al., US 4,879,596, discloses that the optical axis of said sub-camera is adjustable (see figure 4B, direction F and column 5, lines 38-44).

Miura et al., US 4,879,596, does not state that the two cameras are inclined toward the main camera side with respect to the shooting direction between said main camera and said sub-camera, but the reference does teach that when one camera captures the target object the second camera is rotated so that its optical axis coincides with first camera (see column 5, lines 12-44). Therefore, it would have been obvious to one skilled in the art to adjust both cameras to have an incline towards the camera side when capturing an object outside of the sub camera's viewing area on the main camera side.

In regard to claim 11, Miura et al., US 4,879,596, discloses the stereo camera apparatus as recited in claim 2, but does not disclose that a first acute angle defined

between said optical axis of said main camera and the baseline is larger than a second acute angle defined between said optical axis of said sub-camera and the baseline.

It would have been obvious to one skilled in the art that since both cameras can be adjusted freely in the horizontal direction, the sub-camera would be pivoted more than the main camera in order for the camera, to have the same field of view.

In regard to claims 10, 12, 13, and 14, Miura et al., discloses a stereo camera as recited in claims 9, 11, 3 and 4 respectively, but does not disclose the detection of infinite distance corresponding points.

Tanigawa et al., US 5,915,033, discloses a stereo camera system that divides a wide visual field into a plurality of windows or regions, disposed in a two dimensional matrix, calculating the infinite distance correspondence points to detect the parallax between the distances for a pair of images captured by the image sensors for each window, to select the most reliable range of distance to the target and determine in which window the target is located and then correct the distance data (see column 2, line 38 to column 3, line 8).

It would have been obvious to a person skilled in the art at the time of invention to modify Miura et al, US 4,879,596, in view if Tanigawa et al., US 5,915,033, to have the method and apparatus for dividing the wide visual field into a plurality of windows, and calculating the infinite distance correspondence point to detect the parallax between the distances of the two image captured for each window, including the one positioned at an end of the sub-camera side, to determine the distance to the target object as taught by Tanigawa.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al., US 4,879,596, in view of Lipton et al., US 5,063,441.

In regard to claim 6, Miura et al., US 4,879,596, discloses the stereo camera apparatus of claim 1. The Miura reference lacks CCD cameras. Lipton et al., US 5,063,441, discloses a stereo video camera apparatus wherein both cameras are CCD cameras (see column 5, lines 27-31). The Lipton reference uses CCD cameras because most, if not all, future video cameras would incorporate some form of solid-state sensors.

It would have been obvious to a person skilled in the art, at the time of invention, to modify Miura et al., US 4,879,596, in view of Lipton et al., US 5,063,441, to have CCD cameras in order to update the camera system with a most modern technology.

9. Claims 7, 15, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al., US 4,879,596 in view of Saneyoshi et al., US 5,410,346.

In regard to claim7, Miura et al., US 4,879,596 discloses the stereo camera apparatus of claim 1. The Miura reference lacks wherein said cameras are mounted in the vicinity of a rear-view mirror of a vehicle, said cameras taking photographs of views outside the vehicle. Saneyoshi et al., US 5,410,346, also discloses a discloses a stereo camera apparatus (see figure 2, element 10) comprising:

a main camera taking photograph of an object in a shooting direction (see figure 2, element 11a and column 7, lines 40-51); and

a sub-camera taking photograph of said object from a point of view different from a point of view of said main camera (see figure 2, element 11b and column 7, lines 40-51),

said main camera and sub-camera being disposed with a predetermined spacing in a direction substantially perpendicular to the shooting direction (see figure 2, elements 11a and 11b and column 7, lines 40-51),

wherein said cameras are mounted in the vicinity of a rear-view mirror of a vehicle, said cameras taking photographs of views outside the vehicle (see figure 1 and figure 2).

It would have been obvious for a person skilled in the art, at the time of invention, to modify Miura et al., US 4,879,596, in view of Saneyoshi et al., US 5,410,346, to have cameras are mounted in the vicinity of a rear-view mirror of a vehicle, taking photographs of views outside the vehicle in order to monitor the conditions in front of the car.

In regard to claim 15, Miura et al., US 4,879,596, discloses a stereo camera apparatus (see figure 5) comprising:

a main camera taking photograph of an object (see figure 4, element 20a and column 3, lines 8-9); and

a sub-camera taking photograph of said object from a point of view different from a point of view of said main camera (see figure 4, element 20b and column 3 lines 8-9),

said main camera and sub-camera being disposed with a predetermined spacing, a shooting direction of said stereo camera is substantially perpendicular to said predetermined spacing in a baseline between the main camera and the sub

camera (see figure 2, elements 20a and 20b and column 1, line 63- column 2, line 5),

wherein optical axes of said main camera and said sub-camera are adjustable (see figure 4B, directions E or F, column 3, lines 62-65, and column 4, lines 7-9).

Miura et al., does not state that the two cameras are inclined toward the main camera side with a predetermined angle defined by each of the optical axes and the shooting direction. The Miura reference discloses that the two cameras can both be adjusted both horizontally (see column 3, lines 62-65, and column 4, lines 7-9) and vertically (see (column 3, lines 32-35, and column 3, lines 45-47). Thus, the stereo cameras of the Miura reference are adjusted to incline to the first camera side or the second camera side depending the target object. The reference does teach that when one camera captures the target object the second camera is rotated so that the cameras have the correct convergence angle (see column 5, lines 12-44).

Therefore, it would have been obvious to one skilled in the art to adjust both cameras of the Miura reference to have an incline towards the main camera side with a predetermined angle defined by each of the optical axes and the shooting direction when capturing an object outside of the sub-camera's viewing area on the main camera side in order to achieve the correct convergence angle.

The Miura reference does not disclose the stereo camera is installed in the front of a vehicle, substantially perpendicular to a central axis of the vehicle. Saneyoshi et al., US

5,410,346, also discloses a discloses a stereo camera apparatus (see figure 2, element 10) comprising:

a main camera taking photograph of an object in a shooting direction (see figure 2, element 11a and column 7, lines 40-51); and

a sub-camera taking photograph of said object from a point of view different from a point of view of said main camera (see figure 2, element 11b and column 7, lines 40-51),

said main camera and sub-camera being disposed with a predetermined spacing in a direction substantially perpendicular to the shooting direction (see figure 2, elements 11a and 11b and column 7, lines 40-51),

wherein said cameras are mounted in the vicinity of a rear-view mirror of a vehicle, said cameras taking photographs of views outside the vehicle (see figure 1 and figure 2).

It would have been obvious for a person skilled in the art, at the time of invention, to have been motivated to modify Miura et al., US 4,879,596, in view of Saneyoshi et al., US 5,410,346, to have disclose the stereo camera is installed in the front of a vehicle, substantially perpendicular to a central axis of the vehicle as claimed in claim 15 in order to monitor the conditions in front of the car.

In regard to claim 17, Miura et al., US 4,879,596, in view of Saneyoshi et al., US 5,410,346, discloses the stereo camera apparatus as recited in claims 15. The Miura reference discloses wherein the optical axis of said sub-camera is adjustable (see figure 4B, directions E or F and column 5, lines 38-44).

Miura et al., does not state that the two cameras are inclined toward the main camera side with respect to the shooting direction between said main camera and said sub-camera but the reference does teach that when one camera captures the target object the second camera is rotated so that its optical axis coincides with first camera (see column 5, lines 12-44). Therefore, it would have been obvious to one skilled in the art to adjust both cameras to have an incline towards the main camera side when capturing an object outside of the sub camera's viewing area on the main camera side in order to achieve the correct convergence angle.

In regard to claim 18, Miura et al., US 4,879,596, in view of Saneyoshi et al., US 5,410,346, discloses the stereo camera apparatus as recited in claim 15. The Miura reference further comprises:

> a camera stay (see figure 2, element 24) for mounting said cameras thereon, wherein a longitudinal direction of said camera stay is substantially perpendicular to the shooting direction (see column 3, lines 9-12).

In regard to claim 19, Miura et al., US 4,879,596 in view of Saneyoshi et al., US 5,410,346, discloses the stereo camera apparatus of claim 15. The Miura reference does not disclose using CCD cameras. The Saneyoshi reference uses CCD cameras (see column 7, lines 40-51).

It would have been obvious to a person skilled in the art, at the time of invention, to modify Miura et al., US 4,879,596, in view of Saneyoshi et al., US 5,410,346, to have CCD cameras in order to update the camera system with a more modern technology.

In regard to claim 20, Miura et al., US 4,879,596, in view of Saneyoshi et al., US 5,410,346, discloses the stereo camera apparatus of claim 15. The Saneyoshi reference discloses wherein said cameras are mounted in the vicinity of a rear-view mirror of a vehicle, said cameras taking photographs of views outside the vehicle (see figures 1 and 2).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gevell Selby whose telephone number is 703-305-8623. The examiner can normally be reached on 8:00 A.M. - 5:30 PM (every other Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-9644. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gvs

TUAN HO
PRIMARY EXAMINER